III. AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently amended) A cleaner for removing particles from a surface by propelling a fluid onto the surface, the cleaner comprising:

at least one partition adjacent a fluid nozzle, each partition defining:

a central cavity configured to define the fluid departing the surface into a first vortex; ~~and~~

a side cavity adjacent the central cavity configured to define fluid escaping from the central cavity into a second vortex; and

wherein a main body of the first vortex and a main body of the second vortex are fluidly interconnected.

2. (Original) The cleaner of claim 1, wherein the fluid nozzle propels the fluid substantially perpendicular onto the surface.

3. (Original) The cleaner of claim 1, wherein each side cavity is coupled to a vacuum to remove at least part of the escaping fluid to remove particles.

4. (Original) The cleaner of claim 3, wherein a vacuum volume is greater than ninety percent (90%) of a fluid nozzle delivery volume.

5. (Original) The cleaner of claim 1, wherein each partition is distanced from the surface by a partition distance, and the fluid nozzle is distanced from the surface by a nozzle standoff distance.

6. (Original) The cleaner of claim 5, wherein the partition distance is less than a distance from a centerline of the fluid nozzle to the partition.

7. (Original) The cleaner of claim 5, wherein the nozzle standoff distance is no less than 1.2 times the partition distance and no greater than twice the partition distance.

8. (Original) The cleaner of claim 5, wherein a Reynolds number based on a fluid velocity as a reference velocity and the partition distance as a reference distance is no less than 7,500 and no greater than 20,000.

9. (Original) The cleaner of claim 5, wherein a distance from a centerline of the fluid nozzle to each partition is greater than five times an inner diameter of the fluid nozzle.

10. (Currently amended) The cleaner of claim 5, wherein a ratio of a lateral distance of each side cavity ~~between a partition and a vacuum entry~~ to the partition distance is greater than 10, and wherein the lateral distance of each side cavity is measured between a partition and a vacuum entry.

11. (Original) The cleaner of claim 1, wherein the central cavity forms an angle with the horizontal at each partition of greater than 0° and less than 65°, and each side cavity forms an angle with the horizontal at each partition of greater than 20° and less than 90°.

12. (Original) The cleaner of claim 1, wherein the central cavity forms an angle relative to a vertical edge of the fluid nozzle of no less than 80° and no greater than 135°.

13. (Original) The cleaner of claim 1, wherein each second vortex has a larger diameter and less energy than the first vortex.

14. (Original) The cleaner of claim 1, wherein the cleaner is placed above the surface.

15. (Original) The cleaner of claim 1, wherein each cavity extends in a planar fashion.

16. (Original) A cleaner for removing particles from a surface by propelling a fluid against the surface, the cleaner comprising:

means for delivering a fluid under pressure to an area on the surface;

means for forming fluid departing the surface into at least one first vortex adjacent the area and in contact with the surface, and at least one second vortex adjacent each first vortex and in contact with the surface; and

means for evacuating particles by removing a part of the second vortex.

17. (Original) The cleaner of claim 16, wherein the first and second vortices are counter-rotating relative to one another.

18. (Original) The cleaner of claim 16, wherein each second vortex has a larger diameter and less energy than a respective first vortex.

19. (Original) A method for removing particles from a surface by propelling a fluid against the surface, the method comprising the steps of:

delivering a fluid under pressure to an area on the surface;

forming fluid departing the surface into at least one first vortex adjacent the area and in contact with the surface, and at least one second vortex adjacent each first vortex and in contact with the surface; and

removing particles by removing at least part of the second vortex.

20. (Original) The method of claim 19, wherein the forming step includes forming each second vortex to have a larger diameter and less energy than a respective first vortex.